UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/582,488	06/12/2006	Yasunaga Kayama	127629	2205

25944 7590 06/25/2009

OLIFF & BERRIDGE, PLC
P.O. BOX 320850
ALEXANDRIA, VA 22320-4850

EXAMINER	
ASFAW, MESFIN T	

ART UNIT	PAPER NUMBER
2851	

MAIL DATE	DELIVERY MODE
06/25/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/582,488	KAYAMA ET AL.	
	Examiner	Art Unit	
	Mesfin T. Asfaw	2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 March 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Acknowledgement is made to the amendment filed on 2/06/2009.

Acknowledgement is also made to the Supplemental Amendment filed on 3/10/2009. Claims 1-44 are presently pending in this application.

Claim Objections

1. Claims 37 and 38 are objected to because of the following informalities: Claims 37 and 38 are apparatus claims which are dependant on Claim 17 which is a method Claim. For the purpose of examination, the Examiner considered Claims 37-38 to be method claims. Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suwa [US 6191429 B1] in view of Maria Derksen et al. [US 20040211920 A1, hereinafter referred as Maria Derksen].

As per Claims 1, 26, and 34-35, Suwa teaches an exposure apparatus (See fig. 1) comprising:

a substrate table WH (wafer holder (chuck)) that is movable while holding a substrate (Column 9 lines 24-35);

an optical member PL that forms a pattern onto the substrate W on the substrate table WH through a liquid LQ which at least partially fills a space between the optical member and the substrate (See fig. 9, Column 23 lines 1-8).

a correcting device that corrects a positional deviation occurring in at least one of the substrate on the substrate table and the substrate table (See fig. 4, Column 11 lines 50-60 and Column 10 lines 36-48, where the control units 20, 35 and 38 are reading positional error signals from the detection system and corrects the positional deviation on the substrate and substrate table which could have happened due to any reason including supply of liquid, shape of the substrate table).

Suwa does not explicitly teach the liquid is supplied so that it only partially covers the substrate.

Maria Derksen teaches a liquid supply system to provide liquid on only a localized area of the substrate and in between the final element of the projection system and the substrate (the substrate generally has a larger surface area than the final element of the projection system) (Para 13 wherein the immersion area is movable on the surface of the substrate in accordance with the movement of the substrate table in order to expose all the area of the wafer surface).

Therefore, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to incorporate the liquid supply system of Maria Derksen that supplies liquid only in the localized area of the substrate in order to avoid movement of

large body of liquid which requires additional or more powerful motors and creates turbulence in the liquid that lead to undesirable and unpredictable effects as per Maria Derksen.

As per Claim 2, Suwa in view of Maria Derksen teaches the exposure apparatus of Claim 1, Suwa teaches a position measuring device (GDL, GDC, GDR are controlled by 38, 33 controlled by 35) that obtains positional information of the substrate table, wherein the correcting device corrects a positional deviation occurring in at least one of the substrate and the substrate table according to the position of the substrate table which is obtained by the position measuring device (See fig. 4, Column 11 lines 50-60 and Column 10 lines 36-48, where the control units 20, 35 and 38 are reading positional error signals from the detection system and corrects the positional deviation on the substrate and substrate table which could have happened due to any reason including supply of liquid, shape of the substrate table).

As per Claim 3, Suwa also teaches the correcting device corrects an error in the positional information in at least one of the substrate and the substrate table obtained directly or indirectly by the position measuring device, which occurs due to supply of the liquid (See fig. 4, Column 11 lines 50-60 and Column 10 lines 36-48, where the control units 20, 35 and 38 are reading positional error signals from the detection system and corrects the positional deviation on the substrate and substrate table which could have happened due to any reason including supply of liquid, shape of the substrate table).

As per Claim 4, Suwa teaches the correcting device corrects a positional deviation that occurs by a change in the shape of the substrate table (See fig. 4,

Column 11 lines 50-60 and Column 10 lines 36-48, where the control units 20, 35 and 38 are reading positional error signals from the detection system and corrects the positional deviation on the substrate and substrate table which could have happened due to any reason including supply of liquid, shape of the substrate table).

As per Claim 5, Suwa teaches the substrate table has a fiducial member used for position setting, and the correcting device corrects a positional deviation between the fiducial member and the substrate (Column 9 lines 18-24).

As per Claim 6, Suwa teaches wherein the correcting device corrects the distance between the optical member and the substrate in an optical axis direction of the optical member (Column 17 lines 31-44).

As per Claims 7-9, Suwa teaches the correcting device corrects the positional deviation according to a physical quantity related to the liquid wherein the physical quantity related to the liquid includes at least one of pressure of the liquid and surface tension of the liquid or by vibration of the substrate table (if deformation of the substrate or the substrate table or positional error of a substrate occurs due to liquid pressure or vibration of the table, the correcting device corrects the error regardless of its cause because the measuring device measures the positional error and focus error regardless of its cause).

As per Claims 10-11, Suwa teaches the apparatus further comprising:

a mask stage 14 on which a mask (Reticle R) having the pattern formed is mounted that can be moved holding the mask; and the correcting device 20 corrects the positional deviation by changing a thrust given to at least one of the substrate table and

the mask stage (Column 8 lines 36-48). Wherein the correcting device comprises a controller that changes the thrust by feedforward control (See fig. 4, Column 14 lines 11-17).

As per Claim 12, Suwa teaches the correcting device corrects the positional deviation based on position obtaining results of a transferred image of the pattern transferred on the substrate (Column 10 liens 36-48).

As per Claim 13, Suwa teaches the correcting device corrects the positional deviation based on simulation results (Column 17 lines 31-44).

As per Claim 27, Suwa teaches the substrate table has a holding member that holds the substrate and plate members arranged in the periphery of the holding member (Column 6 line 55—Column 7 line 7).

As per Claims 14, 29 and 36, Suwa teaches a stage device 34 that has a substrate table WH (wafer holder (chuck)) which movably holds a substrate W whose surface is supplied with a liquid (See fig. 9), the device comprising:

a position measuring device (units like 33, GDL, GDC, GDR) that obtains positional information of the substrate table; and

a correcting device (the control unit) that corrects a positional deviation occurring in at least one of the substrate on the substrate table and the substrate table (See fig. 4, Column 11 lines 50-60 and Column 10 lines 36-48, where the control units 20, 35 and 38 are reading error signals from the detection system and corrects the positional deviation on the substrate which could have happened due to any reason including due to supply of liquid, shape of the substrate table).

Suwa does not teach the immersion area is smaller than the surface of the substrate on the substrate table.

Maria Derksen teaches a liquid supply system to provide liquid on only a localized area of the substrate and in between the final element of the projection system and the substrate (the substrate generally has a larger surface area than the final element of the projection system) (Para 13) wherein the immersion area is movable on the surface of the substrate in accordance with the movement of the substrate table in order to expose all the area of the wafer surface (See fig. 9 and in order to expose different areas of the wafer the immersion area must move on the surface of the substrate).

Therefore, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to incorporate the liquid supply system of Maria Derksen that supplies liquid only in the localized area of the substrate in order to avoid movement of large body of liquid which requires additional or more powerful motors and creates turbulence in the liquid that lead to undesirable and unpredictable effects as per Maria Derksen.

As per Claim 15, Suwa teaches the correction device corrects a positional deviation that occurs by a change in the shape of the substrate table (if deformation of the substrate or the substrate table or positional error of a substrate occurs due to any reason including the shape of the table, the correcting device corrects the error regardless of its cause because the measuring device measures the positional error and focus error regardless of its cause)

As per Claim 16, Suwa teaches the substrate table has a fiducial member used for position setting, and the correcting device corrects positional deviation between the fiducial member and the substrate (Column 9 lines 18-24).

As per Claims 28 and 31, Suwa teaches the position measuring device obtains positional information of the substrate table without involving the liquid (See fig. 1 measuring device 33).

As per Claim 30, Suwa teaches the substrate table has a holding member that holds the substrate and plate members arranged in the periphery of the holding member (Column 6 line 55—Column 7 line 7) .

As per Claim 39, Suwa teaches a table (wafer holder (chuck) WH) that is movable while holding an object W (wafer) whose surface is supplied with a liquid (See fig. 9), a position measuring device (33, GDL, GDR, GDC) that obtains positional information of the table; and

a control device that obtains a positional deviation related to the positional information of the table obtained by the position measuring device (See fig. 4, Column 11 lines 50-60 and Column 10 lines 36-48, where the control units 20, 35 and 38 are reading error signals from the detection system and corrects the positional deviation on the substrate which could have happened due to any reason including due to supply of liquid, shape of the substrate table).

Suwa does not teach an immersion area where the liquid is located is smaller than the surface of the object held by the table.

Maria Derksen teaches a liquid supply system to provide liquid on only a localized area of the substrate and in between the final element of the projection system and the substrate (the substrate generally has a larger surface area than the final element of the projection system) (Para 13, wherein the immersion area is movable on the surface of the substrate in accordance with the movement of the substrate table in order to expose all the area of the wafer surface).

Therefore, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to incorporate the liquid supply system of Maria Derksen that supplies liquid only in the localized area of the substrate in order to avoid movement of large body of liquid which requires additional or more powerful motors and creates turbulence in the liquid that lead to undesirable and unpredictable effects as per Maria Derksen.

As per Claim 40-41, Suwa teaches wherein the control device obtains the positional deviation according to a property of the liquid where the liquid is set between the last element of the projection optical unit and the substrate (Column 9 lines 35-42, if deformation of the substrate or the substrate table occurs due to liquid pressure, surface tension, flow of liquid or due to the contact angle, the correction device corrects the deviation regardless of its cause because the measurement unit measures the deviation and the control unit corrects based on the measurement).

As per Claim 42, Suwa teaches a memory that stores a relation between the property and the positional deviation (Column 13 lines 42-50).

As per Claim 43, Suwa teaches the table has a fiducial member used for position setting of the table, and the control device obtains a positional deviation between the fiducial member and the object held by the table (Column 9 lines 18-24).

As per Claim 44, Suwa teaches the object is a substrate W; and

an optical member PL that forms a predetermined pattern on the substrate W (Column 8 lines 1-11).

As per Claims 17-25, 32-33 and 37-38, Suwa in view of Maria Derksen disclosed the method claimed, because under the principles of inherency, if a prior art device, in its normal and usual operation, would necessarily perform the method claims, then the method claimed will be considered to be anticipated by the prior art device. When the prior art device is the same as a device described in the specification for carrying out the claimed method, it can be assumed the device will inherently perform the claimed process. In re King, 801 F.2d 1324,231 MPEP 2112.02"

Response to Arguments

4. Applicant's arguments with respect to claims 1,14, 17 and 39 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mesfin T. Asfaw whose telephone number is 571-270-5247. The examiner can normally be reached on Monday to Friday, 7:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diane Lee can be reached on 571-272-2399. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mesfin T Asfaw/
Examiner, Art Unit 2851

/Diane I Lee/
Supervisory Patent Examiner, Art Unit 2851